

Core Routing Chassis Switches

opzoon

PT-6600 Series

Overview

The PT-6600 Series Gigabit core routing chassis switches are designed by Opzoon for large campus network cores and metro aggregation to suffice multi-service requirements. The PT-6600 series switches offer 6 and 10 slots in chassis with a flexible product selection available for variety of enhancement modules. All modules are compatible with this series which effectively protect users' investments. PT-6600 Series advantageously supports hardware IPv6, hardware MPLS VPN, and hardware multicast. It can meet the needs of high- performance, high security and multi-task in future campus networks and Metropolitan Area Networks.

The PT-6600 series routing switch modules adopt unified software system platform to provide not only convenience but also cost-saving solutions. With a high-availability of carrier-class by redundant design of management modules, power supplies, fans, and data link layer and system security protection, the PT-6600 series provides high availability, redundancy, and effective protection in large-scale network.



Product Highlights

Performance

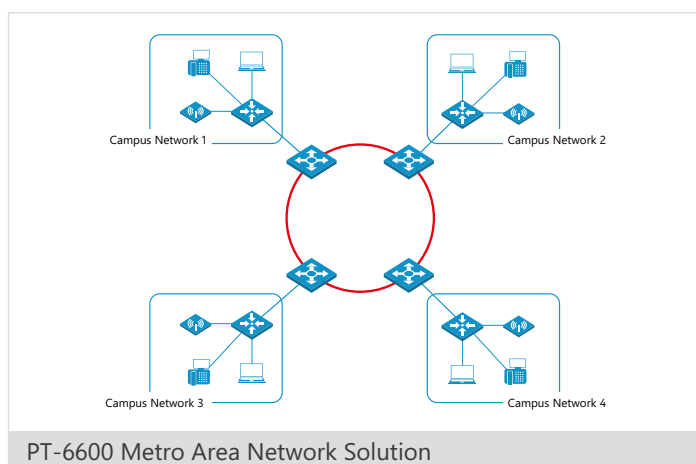
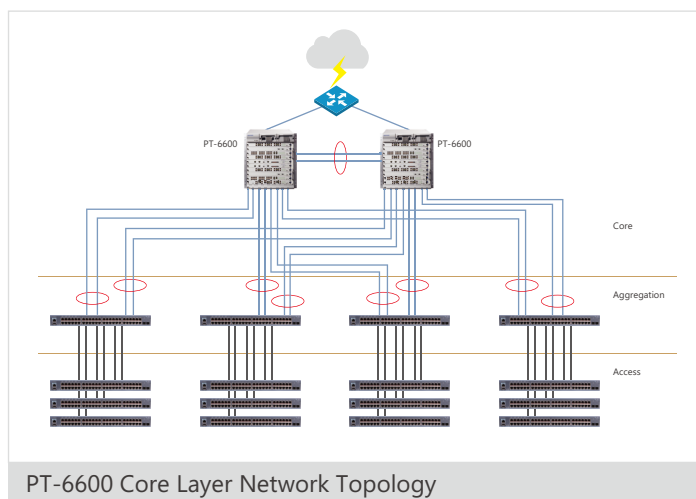
- Up to 3.2Tbps throughput^①
- Up to 2381Mpps forwarding
- Support High port density for 10GbE
- Wire-speed L2/L3 forwarding

Optimized Design

- 1+1 redundant & hot-swappable power supply
- 3 hot-swappable fans
- Dual fail-tolerance management fabric engine

Advanced Provisioning for core layer

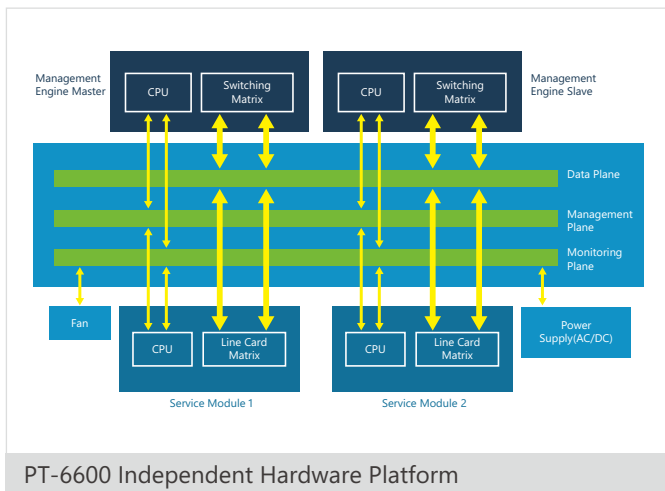
- Independent hardware operation for data, management, and monitoring & control
- Support TCAM accelerated network performance.
- Support EPON
- Support OAM
- Support MPLS VPN
- Support Q-in-Q VLAN
- OPU CPU protection



^① 3.2Tbps throughput is supported by PT-6608 with M2 high-performance management module

Independent Hardware Platform

The PT-6600 Series adopts independent hardware-plane of data, management, and monitoring to separate each communication and forwarding packets avoiding disturbance and raising performance.



ports, even the temperature and humidity of the operating environment events.

Carrier-Class High Availability

The PT-6600 Series is designed to avoid single-point failure from various perspectives. Opzoon’s HA solution provides clever software, smart configuration, and intelligent monitoring to realize a real-time management of entire system operation. Key high availability features include:

- 1+1 hot-swappable power supplies
- Hot-swappable fans
- Live patching
- OPHA for dual management engine
- OPU for CPU protection
- BFD realizing <10ms fault reaction
- OPRP, VRRP
- OAM
- ECMP, PBR, Spanning-tree, LACP, LLDP, ULDP

High Feature Capacity by TCAM

The PT-6600 Series supports TCAM to increase the speed of switch look-up, packet classification, packet forwarding and access control list-based commands. With the TCAM for the entries table makes the look-up process more efficient.

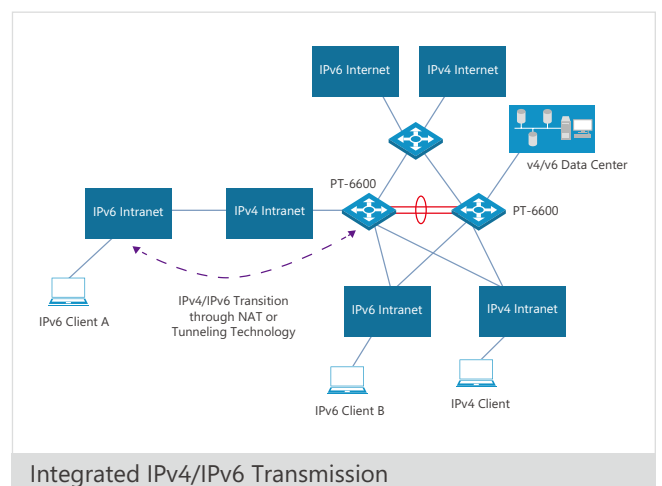
The feature of TCAM lies in enhancing the density and speed to support the exponentially increasing demands placed on networks.

Specialized Technology for System Resource Management

Resources such as memory, FLASH, CPU, ACL table, and routing table are classified by system resource which are limited and costly to network core devices. PT-6600 Series adopts specialized technics to the most efficient management resources of logical utilization. Through Opzoon’s HA solution, PT-6600 series can real-time monitor and alert the state of key elements from CPU, FANs, and power supplies to physical

Seamlessly Switching

Dual management engines provide not only hardware but also logical data link redundancy to guarantee reliability for entire system. Based on intelligent information synchronization technic, management engine acting as a backup undertakes the starts to seamlessly process as a primary engine when the failure was caused by primary engine. Meanwhile, any data flow forwarding (such as IPv4, IPv6, and MPLS) is unaffected and continuous through the data plane.



Efficiency of Network Maintenance

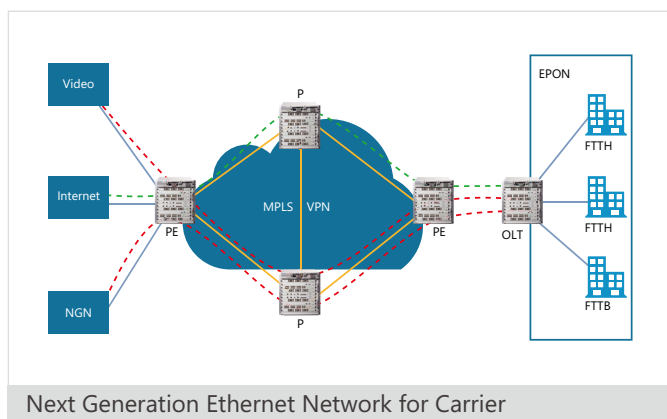
There are three important tasks in carrier-class network including operation, administration, and maintenance, called OAM. The PT-6600 Series supports comprehensive OAM mechanism such as IEEE802.3ah, IEEE802.1ag and ITUT1731 to run the regular activities for link monitoring, remote fault detection, and remote loopback.

Multi-Level of Security Protection

The PT-6600 Series deploys a multi-level security protection mechanism to ensure customers' critical property and data can be accessed safely. These include secure routing and multicast by shared key authentication, variety ACL, MAC security, and authentication and accounting policy.

MPLS VPN

For some demands of high-privacy data transmission and high-security requirements like e-government and campus network, the PT-6600 Series supports MPLS VPN which can effectively offer high performance for these private networks. The distributed MPLS L2/L3 VPN technology is able to implement MPLS backbone device as either PE (provider edge) or P (provider) router. It also provides advanced distribution forwarding capacity via MPLS plus IPv6.



Unified Design with EPON, Routing and Switching Solution

PT-6600 Series provides a unified design to integrate EPON and routing services within a chassis switch offering higher bandwidth, lower cost, and broader service capacities. Furthermore, it can reduce maintenance effort and failure rate; robust L2/L3 functions allowing ONU to carry variety of service requirements. Enhanced PON interface checking with flexible and multifunction EPON service module are sufficient for carriers' demands.

Ideal Design for Efficiency IT architecture

The PT-6600 Series adopts the leading processor to increase efficient utility; the intelligent power supplies and fans provide not only real-time monitoring and dynamic alert, but also automatic adjustment to reach the concept of energy efficiency.

Security Features

- IPv4 / IPv6 Ingress & Egress ACLs using L2, L3, L4 fields
- MAC ACLs
- ACL Drop Logging
- ACL Counters
- DHCP Relay / Snooping
- MAC Security
- TACACS+
- RADIUS
- Hardware and software watchdog

QoS Features

- Up to 8 queues per port
- 802.1p based classification
- DSCP based classification and remarking
- QoS interface trust (COS / DSCP)

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- Strict priority queueing
- Weighted Round Robin (WRR) Scheduling
- ACL based DSCP Marking
- ACL based Policing
- Policing/Shaping
- Rate limiting

Network Management

- 100/1000 Management Port
- RS-232 Serial Console Port
- USB Port
- SNMP v2, v3
- Management over IPv6
- Telnet and SSHv2
- Syslog
- AAA
- CLI/WEB

Standards Compliance

- IEEE802.3 (10BASE-T)
- IEEE802.3u (100BASE-TX)
- IEEE802.3z (1000BASE-X)
- IEEE802.3ab(1000BASE-T)
- IEEE802.3ae (10GBASE-T)
- 802.1D Bridging and Spanning Tree
- 802.1p QOS/COS
- 802.1Q VLAN Tagging
- 802.1w Rapid Spanning Tree
- 802.1s Multiple Spanning Tree Protocol
- 802.1AB Link Layer Discovery Protocol
- 802.3ad Link Aggregation (LACP)
- RFC 2460 IPv6
- RFC 4861 Neighbor Discovery for IP Version 6 (IPv6)
- RFC 4862 IPv6 Stateless Address Autoconfiguration
- RFC 4443 Internet Control Message Protocol (ICMPv6) for the

SNMP MIBs

- RFC 3635 EtherLike-MIB
- RFC 3418 SNMPv2-MIB
- RFC 2863 IF-MIB
- RFC 2864 IF-INVERTED-STACK-MIB
- RFC 2096 IP-FORWARD-MIB
- RFC 4363 Q-BRIDGE-MIB
- RFC 4188 BRIDGE-MIB
- RFC 2013 UDP-MIB
- RFC 2012 TCP-MIB
- RFC 2011 IP-MIB
- RFC 2790 HOST-RESOURCES-MIB
- LLDP-MIB
- LLDP-EXT-DOT1-MIB
- LLDP-EXT-DOT3-MIB
- ENTITY-MIB
- ENTITY-SENSOR-MIB
- ENTITY-STATE-MIB

Physical Specifications

Product	PT-6604	PT-6608
Slots	6	10
Dimension(W*H*D mm)	482*399*548	482*533*548
Working Humidity	10%~90% Non-condensing	10%~90% Non-condensing
Working Temperature	0°C~60°C	0°C~60°C
Power Supply	AC:100-240V, 50±10 Hz; DC:-48V	AC:100-240V, 50±10 Hz; DC:-48V
Storage Temperature	-40°C~80°C	-40°C~80°C
Power Consumption	≤600W	≤1000W
Ports	10/100/1000BASE-T, max 192 ports 1000BASE-SX max 192 ports 1000BASE-LX max 192 ports 10/100BASE-T max 192 ports 10GbE max 32 ports	10/100/1000BASE-T max 384ports 1000BASE-SX max 384 ports 1000BASE-LX max 384 ports 10/100BASE-T max 384 ports 10GbE max 64 ports
Backplane Bandwidth	3.2Tbps	6.4Tbps
Switching Capacity	1.2Tbps/2.4Tbps(M1/M2)	2.4Tbps/3.2Tbps(M1/M2)
Package Forwarding Rate	893Mpps/1786Mpps(M1/M2)	1786Mpps/2381Mpps(M1/M2)
VLAN Table	4K	4K

Features / Specifications

Layer 2 Protocol

IEEE802.1Q (VLAN) IEEE802.1x (Port Control),
IEEE802.1d (STP), IEEE802.1w (RSTP), IEEE802.1s (MSTP)
IEEE802.3x (Flow Control)
IEEE802.3ad Link Aggregation/LACP
• 8 ports
• 32 groups per system
802.1AB Link Layer Discovery Protocol(LLDP)
Port Mirror
IGMP v1/v2/v3 Snooping
QinQ (Flexible QinQ)
GVRP
VLAN, PVLAN
Jumbo Frames (9216 Bytes)

Storm Control

L3 Features(IPv4)

14K IPv4 Routes
4K IPv6 Routes
Static Routes, OSPF, BGP, IS-IS
16-way Equal Cost Multipath Routing (ECMP)
Route Maps
ARP, local ARP proxy
Prevent ARP attack packets including ARP rate limiting, Anti-ARP scan, and ARP guard
ARP re-authorization, ARP port binding
Unicast routing protocol
PBR, VRRP, URPF, black hole routing

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IGMP v1/2/3, PIM-DM, PIM-SM, PIM-SSM, IGMP Proxy, Anycast RP(RFC 4610), static-multicast routing, edge multicast router, constrained-based multicast router

IPv6

ICMPv6, ND

IPv6 static routing, RIPng, OSPFv3, BGP4+, IS-ISv6 etc.

Unicast routing protocols, IPv6 PIM-SM/DM

IPv6 VRRP, IPv6 URPF, IPv6 PBR, IPv6 black hole routing

6to4 tunnel, configured tunnel, ISATAP tunnel, GRE tunnel

Support MLD snooping, IPv6 multicast VLAN, MLD

MPLS

MPLS, LDP

MPLS L3 VPN, MPLS L2 VPN

EPON Feature

IEEE 802.3ah EPON standard

Standard OAM and extension OAM management functions

Encryption for up and down streams

Maximum 64 ONU registration at the same time and DBA dynamic bandwidth distribution

ACL

Standard and extension ACL

High Reliability

Fast Ethernet ring network protection OPRP technology

LLDP, UDLD, BFD

DHCP

DHCP Client

DHCP Relay

DHCP Snooping

DHCP Server

DHCP Option82

Security

IEEE 802.1x, RADIUS, TACACS+

Hardware and software watchdog

NAT Module

NAT speed 200,000 per second, concurrent 2,000,000 per second, multi core CPU(12)

Network Configuration and Management

SYSLOG, FTP/TFTP, NTP

CLI, Telnet, SSH, SNMPv1/v2c/v3

Ordering Information

Model Name	Description
PT-6604	PT-6600 Series 6-Slot 1+1 PSU Redundant Core Routing Chassis Switch with 1x MPT-6600-PWR-AC, 3 x hot-swappable fan, non-Management Module
PT-6608	PT-6600 Series 10-Slot 1+1 PSU Redundant Core Routing Chassis Switch with 1x MPT-6600-PWR-AC, 3 x hot-swappable fan, non-Management Module
MPT-6600-PWR-AC	220V DC Power Supply (600W)
MPT-6608-PWR-AC	220V AC Power Supply (1000W)
MPT-6600-M1	PT-6600 M1 Management Module
MPT-6600-M2	PT-6600 M2 High-Performance Management Module
MPT-6600-4GC20GT	PT-6600 Line Card, 24-Port 10/100/1000BASE-T+4-Port Gigabit SFP(Combo) Module
MPT-6600-4GC20SFP	PT-6600Line Card, 24-Port 1000BASE-X(SFP)+4-Port 10/100/1000BASE-T(Combo) Module
MPT-6600-12GC	PT-6600 Line Card, 12-Port Gigabit Combo Module
MPT-6600-48GT	PT-6600 Line Card, 48-Port 10/100/1000BASE-T Module
MPT-6600-2SFP+	PT-6600 Enhanced Line Card, 2 x 10GbE(SFP+) Module, support MCE, Selective QinQ
MPT-6600-4SFP+	PT-6600 Enhanced Line Card, 4 x 10GbE(SFP+) Module, support MPLS VPN
MPT-6600-8SFP+	PT-6600 Enhanced Line Card, 8 x 10GbE(SFP+) Module, support MCE, Selective QinQ
MPT-6600-12GC-E	PT-6600 Enhanced Line Card, 12 x 10GbE Combo, support MCE, Selective QinQ
MPT-6600-4GC20GT-E	PT-6600 Enhanced Line Card, 24-Port 10/100/1000BASE-T+4-Port Gigabit SFP(Combo) Module, support MCE, Selective QinQ
MPT-6600-4GC20SFP-E	PT-6600 Enhanced Line Card, 24-Port 1000BASE-X (SFP)+4-Port 10/100/1000BASE-T(Combo) Module, support MCE, Selective QinQ
MPT-6600-12GC-X	PT-6600 Enhanced Line Card, 12-Port Gigabit Combo Module, support MPLS VPN
MPT-6600-48SFP	PT-6600 Enhanced Line Card, 48-Port 1000BASE-X(SFP) Module, support MPLS VPN
MPT-6600-ES-NAT	PT-6600 Multiservice NAT Line Card, 12-Port Gigabit Combo Module
SFP-SX	1000BASE-SX SFP Transceiver(850nm,MMF,550m), LC Connector
SFP-LX	1000BASE-LX SFP Transceiver(1310nm,SMF,10km or MMF,550m), LC Connector
SFP-LX-20	1000BASE-LX SFP Transceiver(1310nm,SMF,20km),LC Connector
SFP-LX-40	1000BASE-LX SFP Transceiver(1310nm,SMF,40km),LC Connector
SFP-LX-80	1000BASE-LX SFP Transceiver(1550nm,SMF,80km),LC Connector
SFP-GT	1000BASE-T SFP Transceiver,RJ-45 Connector
SFPP-SR	SFPP-SR 10GbE-SR SFP+ MMF Transceiver(850nm,62.5µm MMF 32m,50µm 500MHz/km MMF 85m,50µm 2000MHz/km MMF 300m),LC Connector, compatible with all SFP+ Module
SFPP-LR	SFPP-LR 10GbE-LR SFP+ SMF Transceiver(1310nm,SMF,10km),LC Connector, compatible with all SFP+ Module
SFPP-ER	SFPP-ER 10GbE-ER SFP+ SMF Transceiver(1550nm,SMF,40km),LC Connector, compatible with all SFP+ Module

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SFPP-80	SFPP-ER 10GbE-ER SFP+ SMF Transceiver(1550nm,SMF,80km),LC Connector, compatible with all SFP+ Module
SFPP-AOC-1M	1m AOC 10GbE Cable, with 2 SFP+ module, compatible with all SFP+ connector
SFPP-AOC-2M	2m AOC 10GbE Cable, with 2 SFP+ module, compatible with SFP+ connector
SFPP-AOC-3M	3m AOC 10GbE Cable, with 2 SFP+ module, compatible with SFP+ connector
SFPP-DAC-1M	1m DAC 10GbE Cable, with 2 SFP+ module, compatible with SFP+ connector
SFPP-DAC-2M	2m DAC 10GbE Cable, with 2 SFP+ module, compatible with SFP+ connector
SFPP-DAC-3M	3m DAC 10GbE Cable, with 2 SFP+ module, compatible with SFP+ connector

Beijing Headquarters

10-11th floor, Tower B, Yintai Center, 2 Jianguomenwai St., Beijing, China 100022

Taipei Global Office

6F.-5, No.408, Ruiguang Rd., Neihu Dist., Taipei City 114, Taiwan
+886-2-7736-9808

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www.opzoon.com

Support

global.support@opzoon.com

Sales

global.sales@opzoon.com

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